IN THE CLAIMS:

Amendments to the Claims

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A method for detecting a defect, comprising the steps of:

repeatedly obtaining image signals of a same portion of a sample by imaging said sample through an optical system by changing optical conditions;

analyzing said repeatedly obtained image signals and selecting plural optical conditions which decrease a difference of contrast in the image signal among segments corresponding to a plurality of regions on said sample;

obtaining image signals of said sample under said selected plural optical conditions by imaging said sample with said optical system ;

evaluating images obtained under said selected plural optical conditions to adjust optical conditions for inspection; and

detecting a defect of said sample by processing image signals of the sample under said adjusted optical conditions;

wherein in the step of evaluating, said images are evaluated so as to determine an inspection threshold, which is greater than a maximum contrast difference among false defects detected at the step of obtaining image signals and with which a maximum number of the true defects can be detected.

2. (previously presented) A method for detecting a defect according to claim 1, wherein the changing of optical conditions includes selecting different transmission ratios of 0-th order diffracted light included in entire light generated by said illumination and reflected from said sample .

Claim 3 (canceled)

4. (previously presented) A method for detecting a defect according to claim 2, wherein the adjusting of the transmission ratio of said 0-th order diffracted light is performed by utilizing a spatial filter that is positioned on or near a Fourier transform plane of said sample and that reduces the transmission ratio of the 0-th order diffracted light.

5. (currently amended) A method for detecting a defect, comprising the steps of:

illuminating a sample through an optical system;

repeatedly obtaining a plurality of image signals of a same portion of said sample through said optical system by changing optical conditions included in entire light generated by said illumination and reflected from said sample and imaging said sample;

selecting plural optical conditions for which defect detection sensitivity is increased by analyzing said repeatedly obtained plurality of image signals having the changed optical conditions;

evaluating images obtained under the selected plural optical conditions and setting the optical conditions for inspection in accordance with the evaluation of the images which includes determining an inspection threshold, which is greater than a maximum control difference among false defects detection at the step of repeatedly obtaining image signals and with which a maximum number of true defects can be detected;

obtaining the image signals by imaging said sample with said optical system while scanning said sample in a viewing field of said optical system under said set optical conditions; and

detecting a defect of said sample by using the image captured under said set optical conditions.

6. (previously presented) A method for detecting a defect, according to claim 5, wherein the sample is illuminated through an objective lens, and the changing of optical conditions includes providing different transmission ratios of 0-th order diffracted light through said objective lens by changing the transmission ratio of the 0-th order light included in entire light generated by said illumination and reflected from said sample and imaging said sample.

Claims 7 - 10 (canceled)

11. (currently amended) An apparatus for detecting a defect, comprising:

a stage for loading a sample;

an illuminating system which illuminates the sample loaded on said stage through an objective lens;

an image detecting unit which forms an optical image of said sample illuminated by said illuminating unit and detects said optical image with a sensor to output the image signals of said sample;

an image processing unit which processes said image signal output from said image detecting unit to detect defects of said sample ; and

a control unit which controls said image detecting unit to repeatedly detect the optical image of said sample by changing optical conditions, and controls said image processing unit to analyze said repeatedly detected image signals and to select plural optical conditions which decrease a difference of contrast in the image signal among segments corresponding to a plurality of regions on said sample, to evaluate images obtained under the selected plural optical conditions and to determine the optical conditions including an inspection threshold, which is greater than a maximum contrast difference among false defects detected and with which the maximum number of the true defects can be detected, which are utilized for inspection so as to decrease a different in contrast in an image signal among segments corresponding to a plurality of regions on said sample.

12. (previously presented) An apparatus for detecting a defect according to claim 11, further comprising a contrast calculating unit which calculates contrast in the image signals of said sample.

Claims 13 - 20 (canceled)

21. (currently amended)A method for detecting a defect, comprising the steps of:

repeatedly obtaining image signals of a same area of a sample by imaging said sample by changing optical conditions;

analyzing said repeatedly obtained image signals and selecting plural optical conditions which modify a contrast in the image signal;

obtaining image signals of said sample under said selected plural optical conditions by imaging said sample with said inspection system;

evaluating images under said selected plural optical conditions to adjust optical conditions for inspection including an inspection threshold, which is greater than a maximum contrast difference among false defects detected at the step of obtaining and with which the maximum number of the true defects can be detected; and

detecting a defect of said sample by processing the image signals of the sample obtained through said inspection system under said adjusted optical conditions.

22. (previously presented) A method according to claim 21, wherein said optical condition is a polarization state of a light which illuminates said sample in the step of obtaining.

Claims 23 - 24 (canceled)

25. (previously presented) An apparatus for detecting a defect, comprising:

an imaging unit which repeatedly obtains image signals of a same area of a sample by imaging said sample by changing optical conditions;

an analyzing unit which analyzes said repeatedly obtained image signals and selects plural optical conditions which modify a contrast in the image signal;

said imaging unit obtaining image signals of said sample under said plural optical conditions;

an evaluating unit which evaluates images obtained under the selected plural optical conditions and which adjusts optical conditions for inspections based on the evaluation of the image which includes determining an inspection threshold, which is greater than a maximum control difference among false defects detected and with which a maximum number of true defects can be detected; and

a detecting unit which detects a defect of said sample by processing the image signals of the sample obtained through an inspection system under said adjusted optical conditions.

26. (previously presented) An apparatus according to claim 25, wherein said optical conditions include a polarization state of a light which illuminates said sample.